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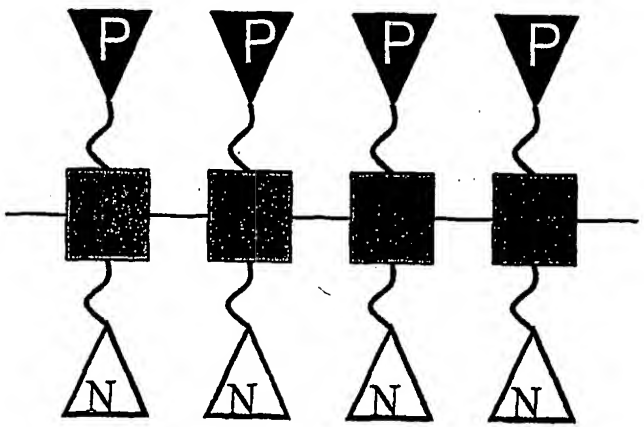
FIG. 1



P = polar group N = nonpolar group

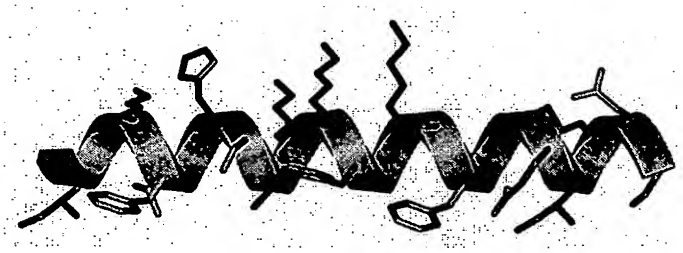
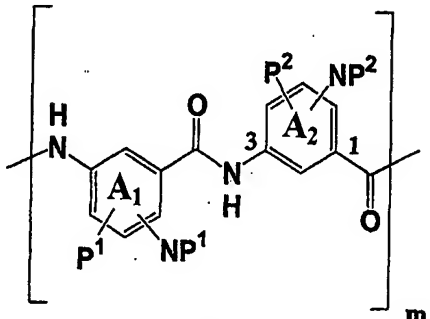


FIG. 2

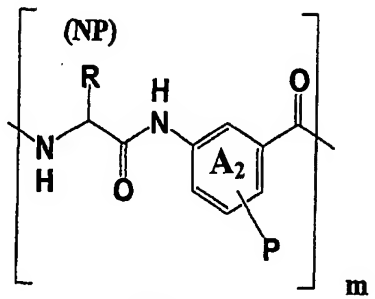
FIG. 3

R^1-[-x-A_1-y-x-A_2-y-]$_m$-R^2

I



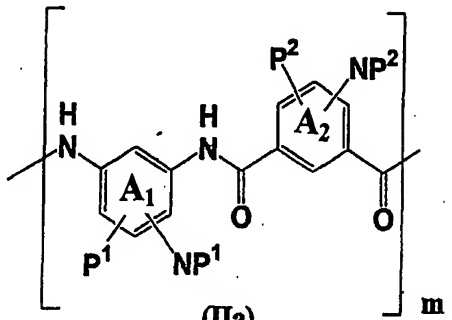
(Ia)



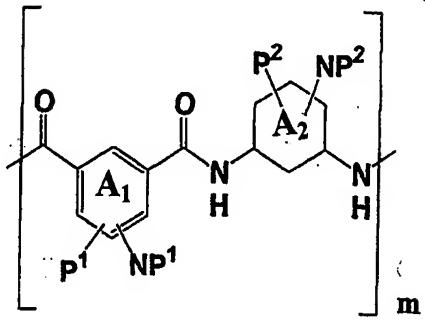
(Ib)

R^1-[-x-A_1-x-y-A_2-y-]$_m$-R^2

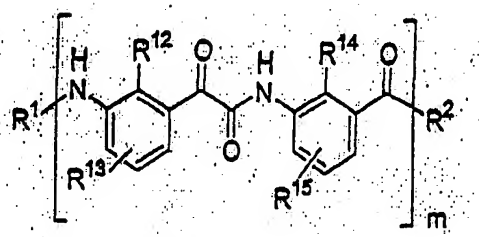
II



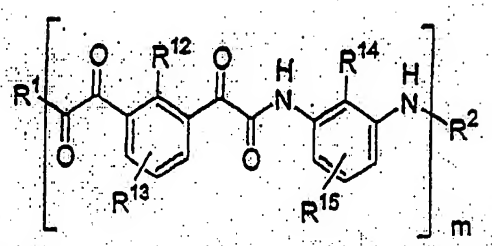
(IIa)



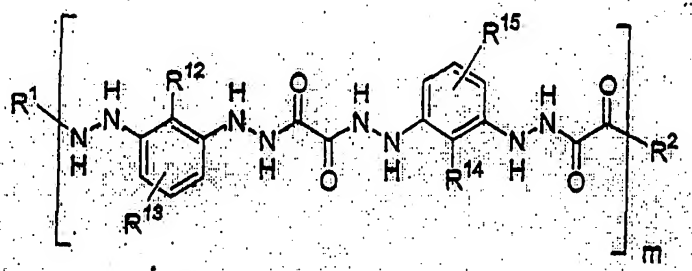
(IIb)



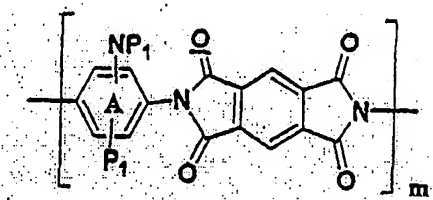
(XV)



(XVI)



(XVII)



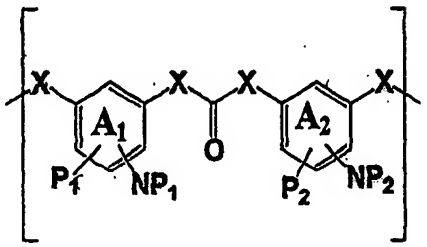
(IVg)

FIG. 4

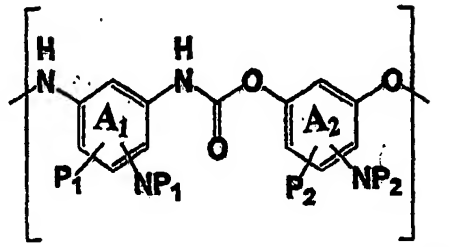
FIG. 5

$$R^1\text{-}[\text{-}x\text{-}A_1\text{-}x\text{-}z\text{-}y\text{-}A_2\text{-}y\text{-}z]_m\text{-}R^2$$

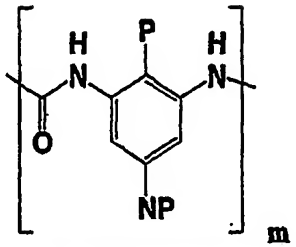
IV



IVa: X = NH; m
IVb: X = O.

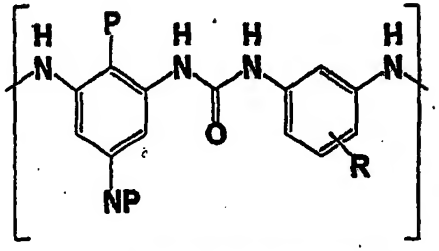


IVc m



m

IVd

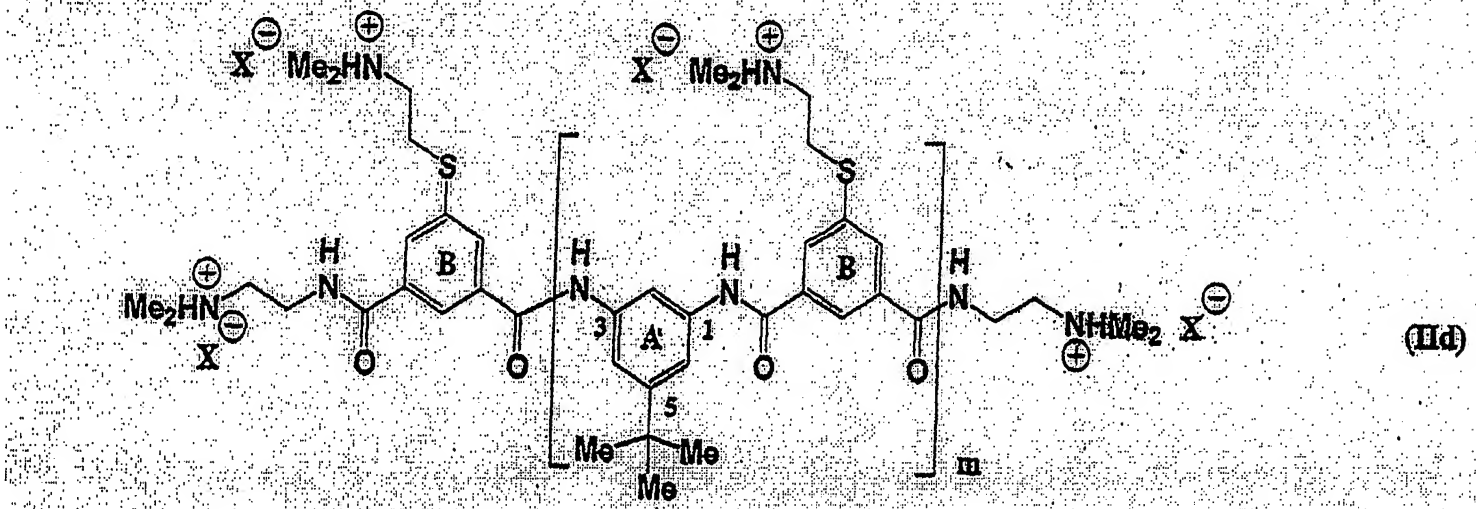


m

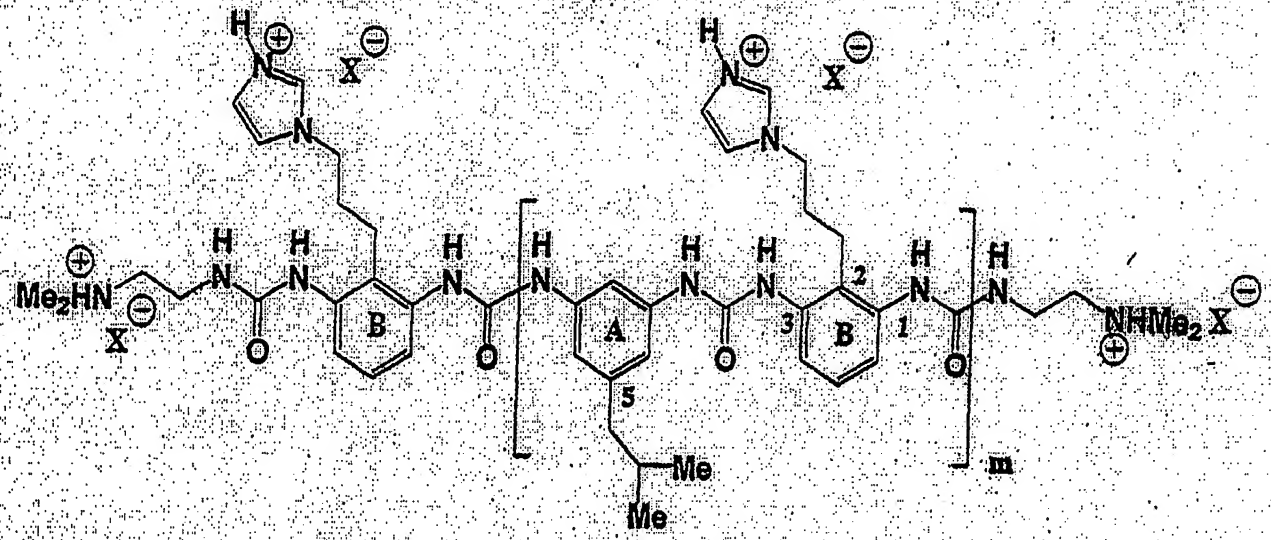
IVe

P	NP[1]	R
O-CH_2-CH_2 NMe_2	O-CH_2CH_3	O-CH_2-CH_2 CH_3
O-CH_2-CH_2 -(2-pyridyl)	O-CH_2CHMe_2	O-$CH_2CH_2CH(CH_3)_2$
O-CH_2-CH_2 $N(CH_2$-CH_2-$NMe_2)_2$	O-$CHMe_2$	O-$CH_2CH_2CH_2CH_3$
O-CH_2-CH_2 -(2-imidazolyl)	OCMe_3	O-CH_2-CH_3
O-CH_2-CH_2 NH-C(=NH)NH_2	O-CH_2-$CHMe_2$	O-CH_2-CH_2 CH_3
O-CH_2-CH_2 $N(CH_2CH_2)_2NH$	$O(CH_2)_4Me$	O-$CH_2CH_2CH_2CH_3$

FIG. 6

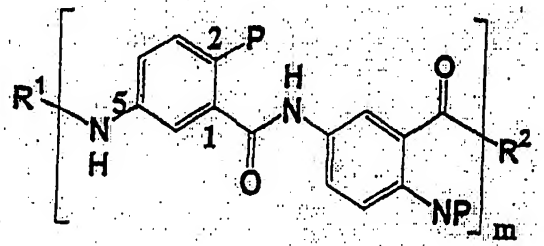

X⊖ Me2HN⊕
S
H
N
B
A
1
3
5
O
Me
Me
Me
m
Me2HN⊕
X⊖
NHMe2 X⊖

(IId)

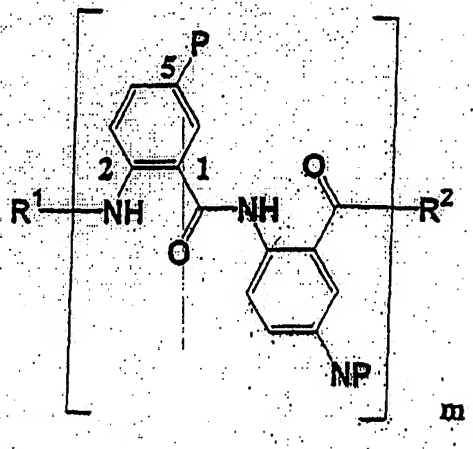

H
N⊕
X⊖
N
Me2HN⊕
X⊖
H
N
B
A
1
2
3
5
O
Me
Me
m
NHMe2 X⊖

(IVf)

FIG. 7

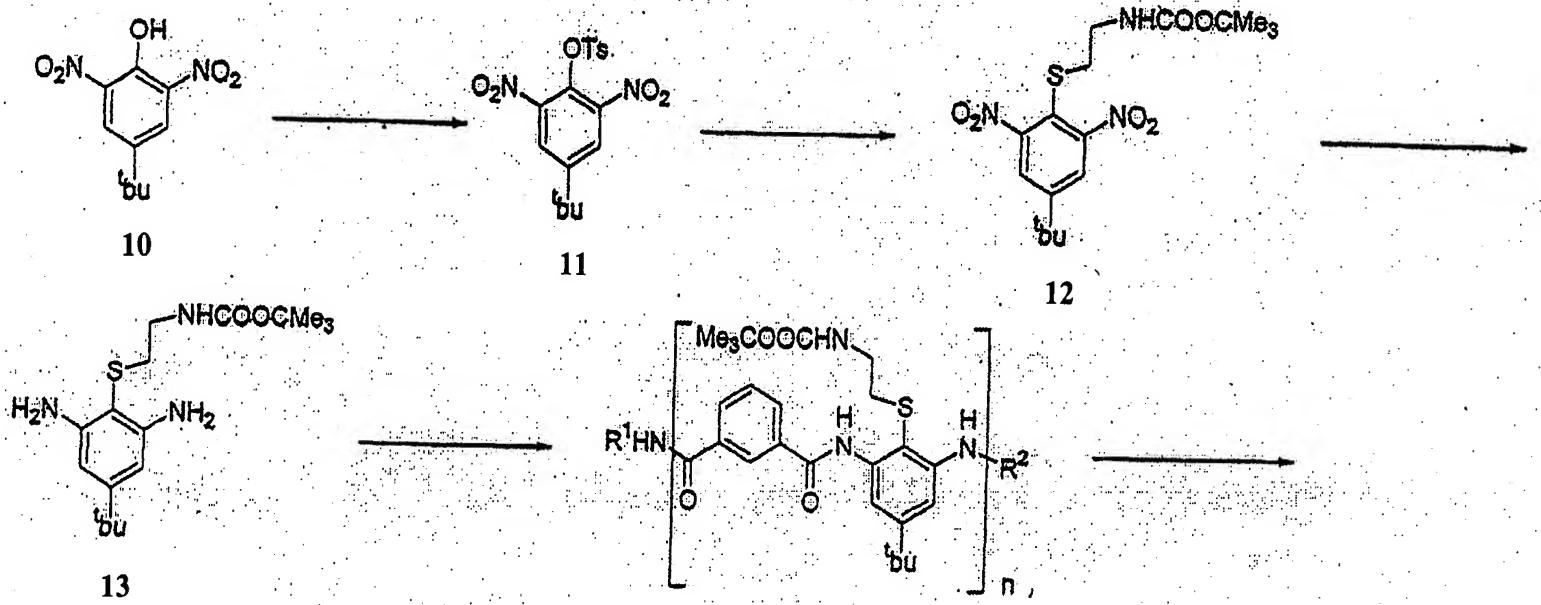


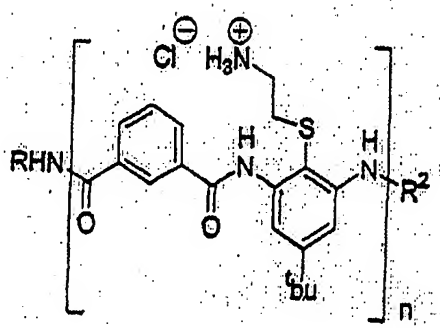
(IIe)



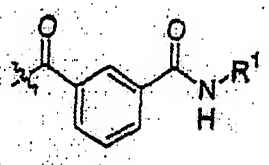
(IIf)

P	NP'
O-CH_2-CH_2-NMe_2	O-CH_2CH_3
O-CH_2-CH_2-(2-pyridyl)	O-CH_2CHMe_2
O-CH_2-CH_2-$N(CH_2CH_2NMe_2)_2$	O-$CHMe_2$
O-CH_2-CH_2-(2-imidazolyl)	OCMe_3
O-CH_2-CH_2-NH-C(=NH)NH_2	O-CH_2-$CHMe_2$
O-CH_2-CH_2-$N(CH_2CH_3)_2$NH	O$(CH_2)_4Me$





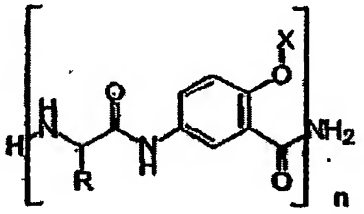
XIa: $R^1 = CH_2CH_2N(CH_3)_2$ R^2 =



XIb: $R^1 = R^2 = H$; n = 2

XIc: $R^1 = R^2 = H$; n = 3

FIG. 8

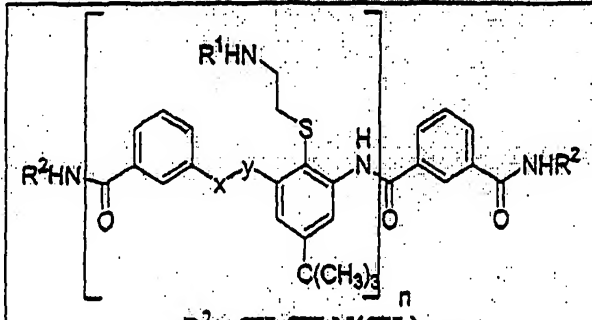


R	X	n	Antimicrobial Activity MIC (μg/mL)[1]			Hemolytic Activity HC_{50} (μg/mL)
			E. c.	*K. p.*	*B. s.*	
$CH_2CH(CH_3)_2$	$(CH_2)_2NHC(=NH)NH_2$	4	20	50	6	200
		5	20	25	6	200
	$(CH_2)_3NH_2$	4	12	50	6	200
		5	12	50	6	200
	$(CH_2)_3NHC(=NH)NH_2$	4	12	50	12	35
		5	12	50	12	8
	$(CH_2)_2NH_2$	2	>60	500	8	>200
		3	>500	>500	37	>200
		4	~30	63	8	>200
$CH(CH_3)_2$	$(CH_2)_2NH_2$	4	100	500	100	
		5	100	500	100	
$CH(CH_3)CH_2CH_3$	$(CH_2)_2NH_2$	4	500	500	20	
		5	100	500	20	
C_6H_5	$(CH_2)_2NH_2$	4	500	500	100	
		5	500	>500	100	
n-C_4H_9	$(CH_2)_2NH_2$	4	500	500	500	
		5	100	500	100	
$(CH_2)_3NHC(=NH)NH_2$	Me	4	>500	500	500	
		5	500	500	500	
$(CH_2)_3NHC(=NH)NH_2$	*iso*-pentyl	4	100	100	6	4
		5	100	100	12	4
$(CH_2)_4NH_2$		2	>500	>500	25	
		4	63	63	≤3	

[1] E.c. *Escherichia coli* D31; K.p. *Klebsiella pneumoniae* 10; B.s. *Bacillus subtilis*

FIG. 9

FIG. 10



R^2= $CH_2CH_2N(CH_3)_2$

				Antimicrobial Activity MIC (μg/mL)					
-x-y-	R^1	n	M_p[7]	K91[1]	K91[2]	D31[3]	K.p.[4]	B.s.[5]	rbc[6]
-CONH-	H	2	756[8]		<18	19	66	12	50
	H	3	1125[8]		<19		19		20
	H	10	6000[9]	<25	12-50	7.5-15	31-50		1
	H	>30	20,000	>200					5
	C(=NH)NH_2		6000			25	100	12.5	8
-NHCONH-	H	2	745[8]	<12.5					15
	H	10	6000		<50				5
	H	>30	20000		100				20

[1] *E. coli* K91 (M9 medium)
[2] *E. coli* K91 (LB medium)
[3] *E. coli* D31 (MH medium)
[4] *Klebsiella pneumoniae* 10 (MH medium)
[5] *Bacteria subtilis* (LB medium)
[6] hemolytic activity-erythrocytes HC_{50} (μg/mL)
[7] The average chain length is determined by the Flory equation and the polymer size is confirmed by gel chromatography with Waters styryl-gel columns were connected in series to give a MW range from 1,000,000 to 300 The peak was eluted with THF and the peak center at maximum height using a size exclusion column. Average polydispersity for these condensation polymers is ~2.5.
[8] Homogenous compound prepared by solid phase synthesis.
[9] *Pseudomonus aeruginosa* 10 IC_{50} 31-62; *Salmonella typhimurium*, S5 IC_{50} <3.75; *Enterococcus faecium* IC_{50} 15-25 (μg/mL).

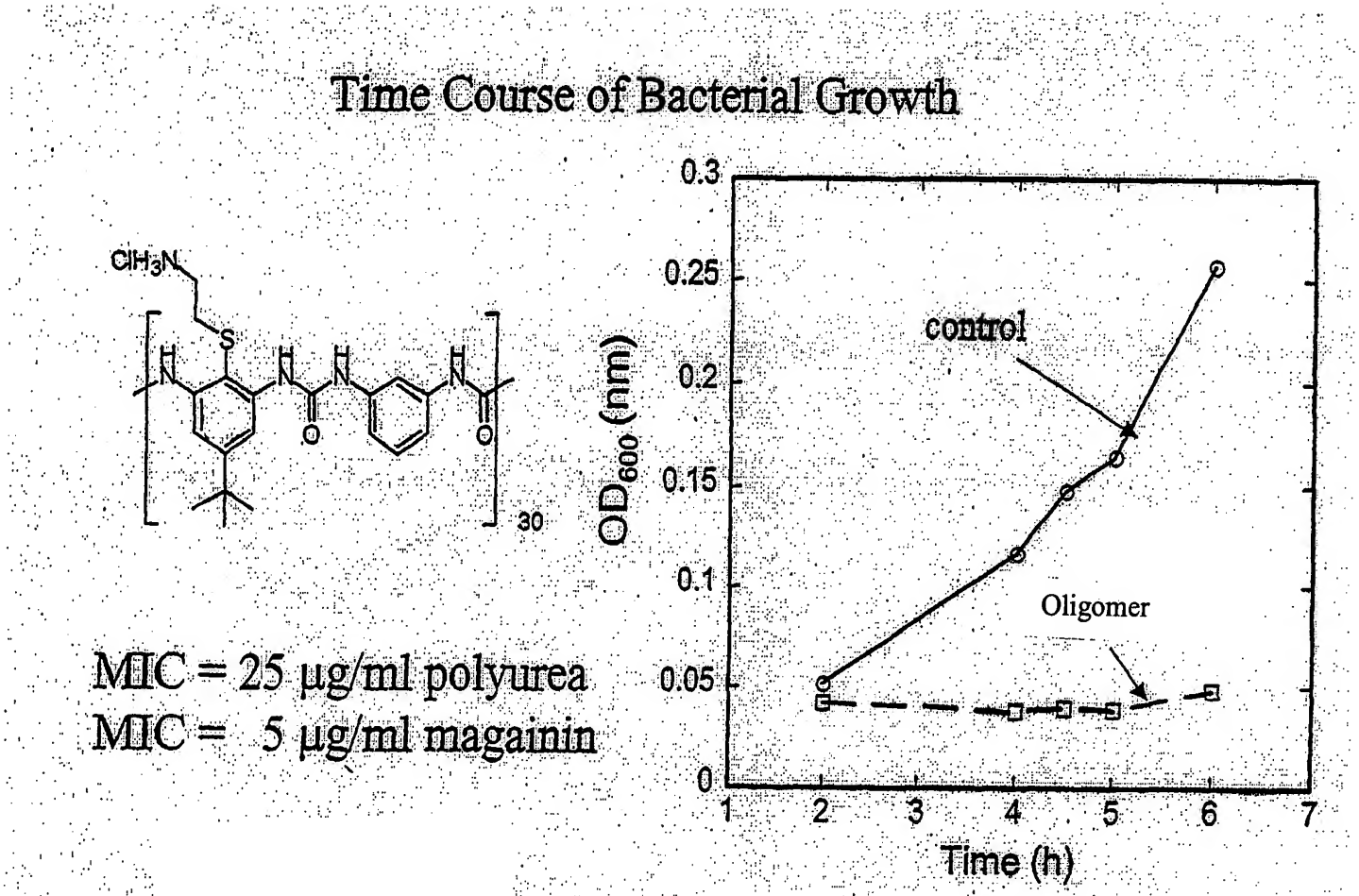

Time Course of Bacterial Growth
ClH3N
S
H
N
O
30
MIC = 25 µg/ml polyurea
MIC = 5 µg/ml magainin
OD600 (nm)
0.3
0.25
0.2
0.15
0.1
0.05
0
control
Oligomer
1
2
3
4
5
6
7
Time (h)

FIG. 11

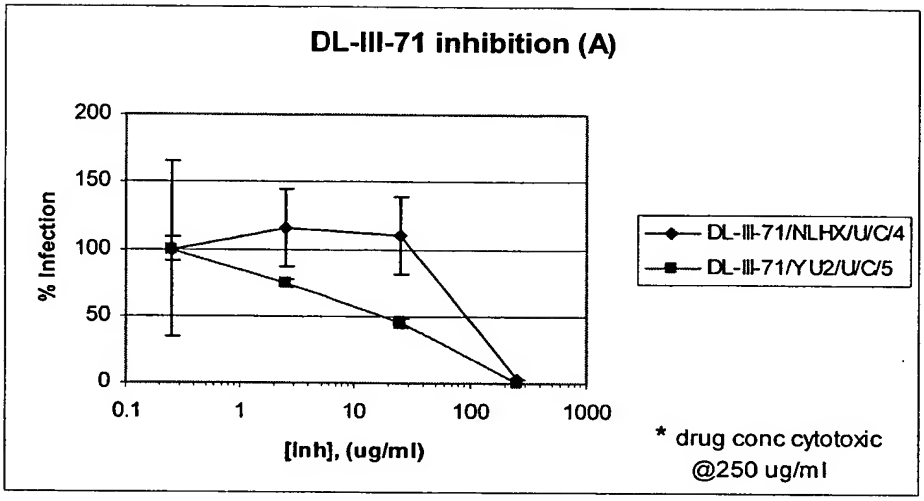

DL-III-71 inhibition (A)
200
150
100
50
0
% Infection
0.1
1
10
100
1000
[Inh], (ug/ml)
DL-III-71/NLHX/U/C/4
DL-III-71/YU2/U/C/5
* drug conc cytotoxic
@250 ug/ml

FIG. 12

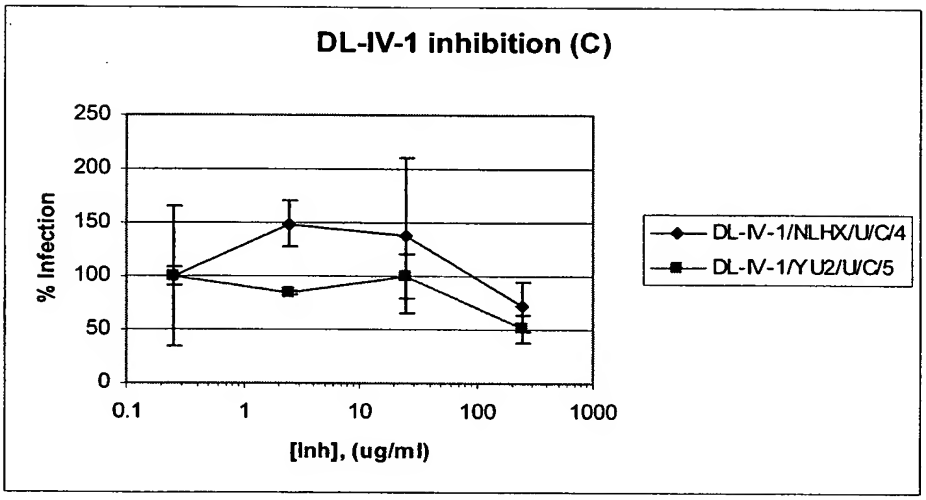

DL-IV-1 inhibition (C)
% Infection
250
200
150
100
50
0
0.1
1
10
100
1000
[Inh], (ug/ml)
DL-IV-1/NLHX/U/C/4
DL-IV-1/YU2/U/C/5

FIG. 13

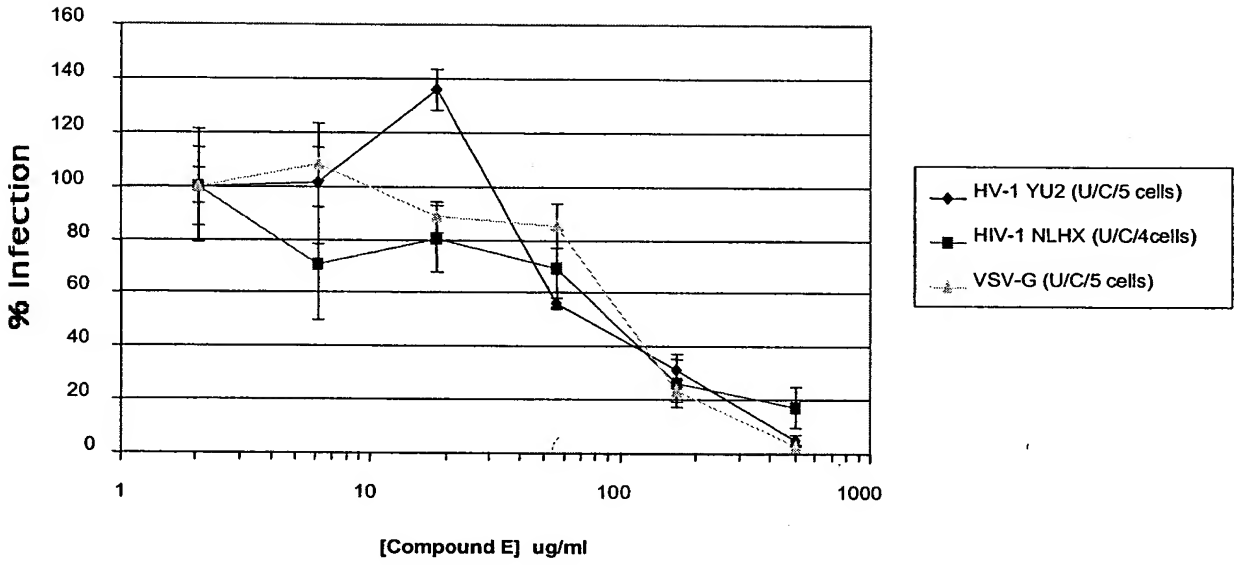
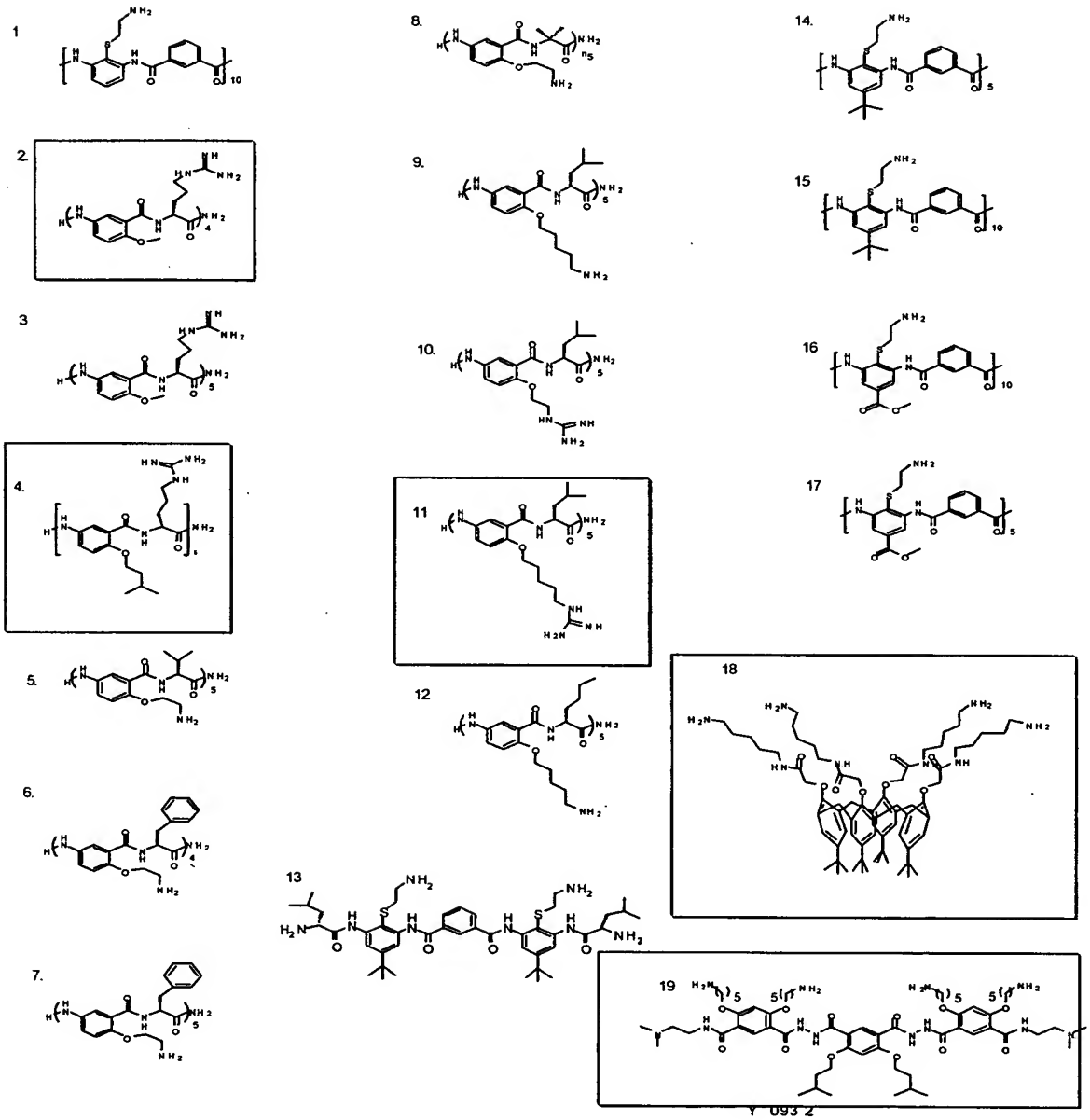

160
140
120
100
80
60
40
20
0
% Infection
1
10
100
1000
[Compound E] ug/ml
HV-1 YU2 (U/C/5 cells)
HIV-1 NLHX (U/C/4cells)
VSV-G (U/C/5 cells)

FIG. 14

FIG. 15 **Compound Structures**



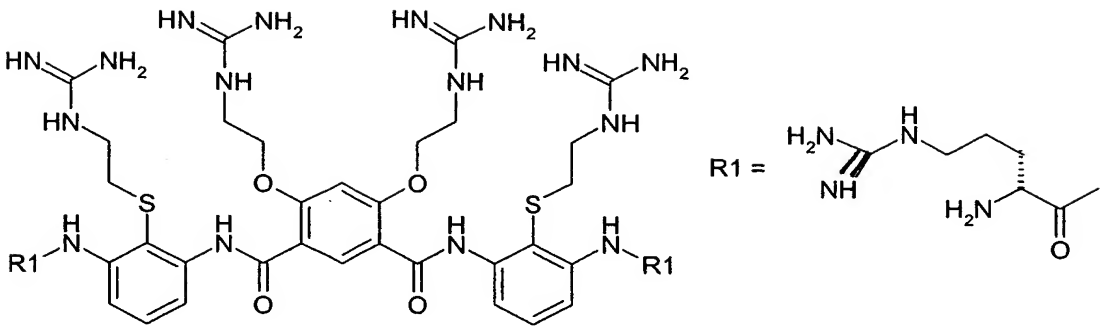


FIG. 16 Pmx10073

FIG. 17 Antagonism of the LMWH Effects on Clotting Time in Whole Blood by Pmxl0073.

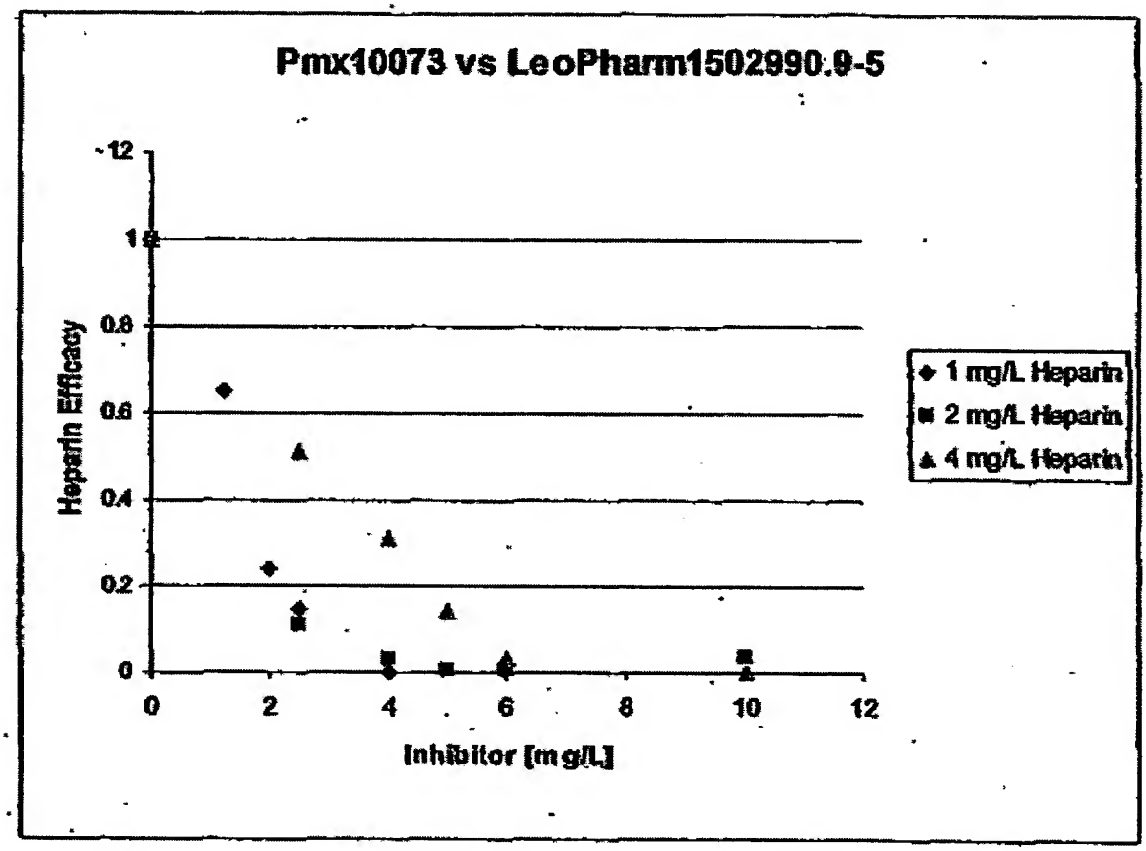
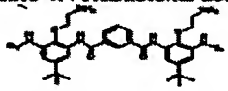


Table 1. Antibacterial activity and selectivity.

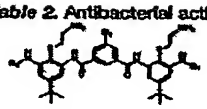


Compound	R_1	MIC (μg/mL)		HC50 (μg/mL)	Selectivity (HC50/MIC)		Relative Hydrophobicity $LogK_{ow}$
		E.coli	S.aureus		E.coli	S.aureus	
1	H	12.5	50	12	0.96	0.24	3.51
2		6.25	12	40	6.4	3.3	3.12
3		6.25	6.25	9	1.4	1.4	3.74
4		6.25	6.25	7	1.1	1.1	3.86
5		25	50	790	32	16	1.45
6		25	100	1230[a]	49	12	2.99
7		50		370	7.4		0.33
8		6.25	12.5	715	110	57	-1.71
MSI-78		12.5		120	9.6		

[a]HC50 was obtained from extrapolating the fitted curve to 50 % lysis

FIG. 18

Table 2. Antibacterial activity and selectivity (continued).



Compound	R_1	R_2	MIC (μg/mL)		HC50 (μg/mL)	Selectivity (HC50/MIC)		Relative Hydrophobicity Log K_{ow}
			E.coli	S.aureus		E.coli	S.aureus	
1	H	H	12.5	50	12	0.96	0.24	3.51
9	H		25	25	110[a]	4.4	4.4	2.61
10			50	200	400	8.0	2.0	1.53
3		H	6.25	6.25	9	1.4	1.4	3.74
11			12.5	12.5	61	4.9	4.9	2.84
8		H	6.25	12.5	715	110	57	-1.71
12			12.5	12.5	>800	>64	>64	-2.61
MSI-78			12.5		120	9.6		

[a]HC50 was obtained from extrapolating the fitted curve to 50 % lysis

FIG. 19

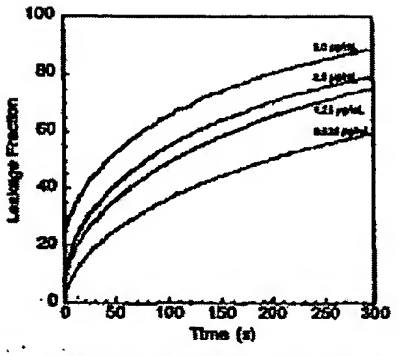


Figure 2. Amphiphilic oligomer 6 induces vesicle leakage.

FIG. 20